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Technology for Better Governance: Insights from Public Health Systems in Kenya

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Introduction

The integration of technology in governance has created transformative possibilities across the world, enhancing the provision of public services. Africa has also benefitted from this wave of digital transformation. Introducing big data applications into governance systems in Africa presents enormous potential for overcoming challenges, including corruption, inefficiency, and poor service delivery. However, while the continent has made strides in digital governance, the full potential of big data is yet to be realised. For example, only a handful of African countries, such as Benin, Ghana, and Rwanda, have initiated e-government platforms, and with varying degrees of success.

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To reap the benefits of big data, there is a need to adopt digital governance in a more holistic manner, which includes leveraging artificial intelligence (AI), the Internet of Things (IoT), and smart city technologies. These innovations can improve policymaking, facilitate performance monitoring, and reduce corruption while enhancing the response time and quality to challenges such as urban migration, famine, and health crises.

However, the over-dependence on external technology solutions and parallel lack of indigenous capability impede the sustainable integration of digital tools in Africa. Locally tailored solutions, capacity building, and data security are also critical to preserving the sovereignty of African nations as they seek to effectively utilise technology. In this regard, and to develop its own solutions, Africa could draw lessons from other Global South countries such as India, where big data applications are being used in urban infrastructure, agriculture, and health.

An excellent illustration of how technology may be used to enhance service delivery in the continent is the use of information and communications technology (ICT) in health governance in Kenya, namely through the District Health Information Software (DHIS 2). Although data collection, analysis, and reporting have improved with the DHIS 2 system, obstacles to its deployment have included resistance from conventional health groups and poor internet connectivity in rural areas. ICTs play an important role in promoting collaborative governance, particularly when handling complicated health concerns that require cross-sectoral cooperation. However, these challenges highlight the need for continued investments in ICT infrastructure, stakeholder engagement, and capacity building to ensure the sustainability and effectiveness of digital health systems.

The two articles in this report highlight the potential of technology to transform governance by improving coordination, accountability, and decision-making. Highlighting the example of Kenya, this report makes a case for collaborative efforts to integrate technology into public administration, focusing on sustainability and inclusivity.

About the Essays

The first article is broader, looking at multiple governance challenges, while the second article provides a micro-view of a specific application of ICTs in the healthcare system. The first essay, *Leveraging Big Data for Governance Transformation in Africa*, explores how big data can facilitate governance in Africa, offering opportunities to enhance service delivery, reduce corruption, and improve efficiency. It discusses how digital technologies can address governance challenges such as corruption, inefficient public services, and resource allocation. The essay emphasises the importance of smart governance, which goes beyond e-government to include tools like AI, IoT, and big data analytics.

The second one, *Towards Collaborative Governance in the Public Sector: Analysis of Health Information Systems in Kenya*, delves into the role of ICTs in improving collaboration among stakeholders in the public sector, specifically through Kenya's DHIS 2, which centralises health data to improve service delivery and accountability. The article explores how ICTs can foster enhanced collaboration among stakeholders and improve service delivery in the healthcare sector.

Both essays highlight how technology can transform governance and the provision of public services. They emphasise the growing importance of technology in governance, with big data and ICTs being central to improving efficiency, transparency, and coordination. For Africa, embracing digital transformation, such as by using big data in governance, offers a chance to leapfrog traditional governance models, potentially overcoming longstanding challenges such as corruption, inefficiency, and the lack of infrastructure. In particular, big data's ability to predict trends, monitor performance, and guide evidence-based policymaking is a powerful tool for countries like Ghana, Rwanda, and Benin, which have seen improvements in their public service delivery systems through digital platforms.

Similarly, Kenya's experience with DHIS 2 underscores the success of ICTs in facilitating intergovernmental collaboration in public health. By improving data accessibility and communication between health facilities, DHIS 2 has contributed to more coordinated and efficient healthcare service delivery. Real-time data collection and analysis have improved the accountability and openness of health systems, reducing errors, enhancing treatment results, and facilitating evidence-based policymaking.

Both articles suggest that, for technology to truly transform governance, there must be a comprehensive strategy that includes local capacity building, strong governance frameworks, and stakeholder engagement. African countries must prioritise investment in ICT infrastructure, training, and cybersecurity while developing their own technological expertise to reduce dependency on external sources. Moreover, there must be a concerted effort to address the challenges of intergovernmental collaboration and data governance to ensure that ICT initiatives such as big data and health information systems can thrive.

I

Leveraging Big Data for Governance Transformation in Africa: Opportunities and Challenges

Israel Nyaburi Nyadera

The advent and evolution of technology have impacted governance and public administration globally. Countries such as Finland, Denmark, and South Korea exemplify smart governance, attributable to their implementation of advanced technology in public service delivery.[1] In Africa, the public sector and the overall public administration practices have historically struggled to meet the expectations of their citizens due to a complex combination of colonialism, military coups, negative impacts of rapid rural-urban migration, nepotism, and corruption.[2] However, given the value and possible benefits of technology, some of these challenges can be overcome if the continent can embrace digital transformation in governance. This essay aims to critically examine the prospects and constraints of big data on governance in Africa.

Current State of Digital Transformation and Public Administration in Africa

By the turn of the new millennium, prospects of digital governance were increasing as the costs of installing new internet-enabled devices reduced significantly, connectivity and access increased, and people became more interconnected. African countries have attempted to keep up with this global trend despite the many challenges experienced.[3] Today, some of the successful cases of big data in Africa include:

- Benin, which launched the Government Data Interoperability system with support from the government of Estonia. The country is offering over 200 services on its e-government platform, cutting across education, transport and electoral services.

- Ghana has implemented the Digital Financial Inclusion platform, a modernised revenue collection and payment system. It also has the GhanaPay system, which allows users to pay for services such as visa applications.

- In Rwanda, the government is partnering with a private company to implement the IremboGov Online Portal. Launched in 2015, this digital platform offers over 100 services from 20 government agencies. So far, over 2.7 million transactions have been completed using this portal.

Beyond E-Government: New Opportunities for Digital Transformation and Governance

While e-government platforms continue to benefit millions of Africans, advancements in technology require a look beyond e-government platforms to see how these can accelerate the quantity and quality of public service delivery. Alongside e-government, a comprehensive digital governance approach can be achieved by adopting artificial intelligence, big data, the Internet of Things, quantum computing, and smart-city technologies. These tools are not only helpful in enhancing the speed and accuracy of service delivery but also serve more people equally and fairly.

For example, big data can assist African governments in addressing challenges by enabling effective performance monitoring and facilitating data-driven policymaking, which is crucial for countries grappling with the effects of ad-hoc policy declarations. Additionally, big data analytics can enhance the understanding of public opinion by analysing various data sources, including social media. In the era of evidence-based decision-making, big data will not only lead to an analysis of current and historical data but will also allow for predicting issues and trends.[4] This can reduce the impact of problems such as flooding, drought, and famine. The early warning capability of big data can also improve response to rural-urban migration, conflicts, public health emergencies, and the population bulge. Furthermore, big data can help reduce corruption and foster accountability and transparency by enabling the government to share information with the public and citizens using that information easily through big data analytics. Also, the recurring problem of wasteful spending can be addressed using big data, allowing for the optimum allocation of resources to areas that matter the most using insights from data. Startups and entrepreneurs can also enhance their productivity and business environment by leveraging information and data from big data. This can also lead to innovation and the invention of new products.

Adopting big data in governance will not require African countries to reinvent the wheel. There already exist many countries from which to adopt best practices. One of these countries is India, which has already begun using big data to improve the living conditions of and service delivery to the people. For example, the Indian government has integrated big data into its Smart Cities agenda. This is seen in its urban infrastructure management, energy consumption, and traffic. The health and agricultural sectors are also benefiting from the input of big data. India is already using big data for telemedicine to monitor patients better, undertake health surveillance to track the spread of diseases, and provide personalised treatment and accurate diagnosis.[5]

Indian farmers benefit from an optimised supply chain and precision farming.[6] India has also adopted big data in the financial sector to deal with fraud, assess credit scores, and evaluate risks. These are areas African countries can benefit from immensely.

Challenges Adopting Big Data in Africa

Despite the opportunities, adopting big data has several limitations. The most significant challenge is an over-dependence on external sources for both technology and ideas.[7] This prevalent issue could prove detrimental to the continent, as technology-producing countries will focus on technologies tailored to their own needs. It is imperative that African countries cultivate local capacity for the production and implementation of digital technologies within their public sectors. Such an approach will ultimately reduce costs and preserve sovereignty. In addition, there must be deliberate and intentional efforts by African governments to shift towards smart governance. African nations must critically reflect on their specific needs, challenges, and the potential benefits of digital transformation and governance. If the advantages of digitalisation and smart governance surpass the drawbacks, then these initiatives should be prioritised in planning and resource allocation. Developing a critical mass of local experts who can lead the big data process is also crucial. By addressing these challenges, African countries can better harness the potential of big data in public administration.

Conclusion

This essay examined the opportunities and challenges of big data and governance in Africa, identifying that public administration is globally transitioning towards smart governance for the more efficient and sustainable delivery of public services. However, to fully gain from big data, there is a need for cooperation in building local capacity and reducing dependence, which is important for cost-cutting and encouraging the creation of a pool of enthusiastic digital champions within Africa. Also, there must be realistic planning by avoiding grandiose plans that may be unachievable. In addition, cautious progression into emerging fields such as big data is important, and African countries should avoid taking huge leaps into uncharted territories. Prioritising data and platform security is crucial, given that the new frontier of conflicts is in the digital space (information, data, and codes).

II

Towards Collaborative Governance in the Public Sector: Analysis of Health Information Systems in Kenya

Zedekia Opondo Sidha

The pioneers of policy implementation studies, such as Jeffrey Leonard Pressman and Aaron Wildavsky, have continually advised policymakers to legislate proposals that are not dependent on multiple agencies for implementation. These sentiments were further entrenched during the new public management revolution that emphasised specialisation and goal attainment over cooperation. In practice, however, many policy problems are boundary-spanning. Violent extremism, climate change, and the COVID-19 pandemic, for instance, are complex and interconnected, demanding stakeholders' collaboration, breaking silos, and forming cross-sectoral teams. The 'joined-up government' and 'whole-of-government' approaches are some of the concepts that have been used to encourage horizontal and vertical collaboration across departments.[8]

Collaboration can improve efficiency, decrease duplication, and leverage diverse resources, but it requires conflict and priority management. This essay discusses how information and communications technologies (ICTs) help stakeholders coordinate complex policy issues. Many scholars have documented how digitalisation increases service delivery, accountability, and public ethics.[9] However, its role in improving collaborative governance remains uncharted. This essay examines Kenya's health information systems to demonstrate how ICTs might enable a whole-of-society approach to boundary-spanning policy issues.

Challenges of Intergovernmental Collaboration

Collaboration is theoretically beneficial but challenging to implement. Pressman and Wildavsky identified six barriers to government cooperation.[10] First, goal imparity happens when agencies only do mission-aligned work, causing conflicts when priorities change. Second, economic development agencies may prioritise rural over urban employment creation despite similar goals. Third, multitasking can reduce focus and urgency. Fourth, leadership and organisational conflicts can inhibit collaboration. Fifth, legal and procedural incompatibilities are difficult. Finally, standard operating procedures may limit agency flexibility and cooperation.[11] With these assertions, they advise governments to make policies that are not dependent on more than one agency for implementation.

ICTs as an Enabler for Stakeholder Coordination and Policy Implementation

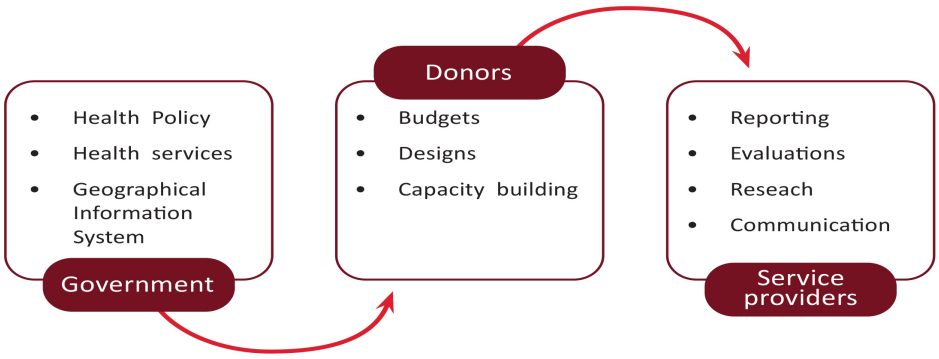
ICTs can improve stakeholder collaboration and policy execution. Digitising governmental administration boosts efficiency, openness, and accountability. ICTs allow stakeholders to communicate and share information in real time, facilitating coordinated action and informed decision-making. Kenya's District Health Information Software (DHIS 2) shows how ICTs affect stakeholder coordination. The 2011 web-based DHIS 2 increases data collection, analysis, and reporting of health system data.[12] DHIS 2 intends to centralise health reporting, standardise report outputs at all levels, connect service delivery data with other health databases, increase ICT infrastructure, train people to manage the system, and ensure stakeholder support[13] (see Figure 1 for DHIS 2 stakeholders).

Using DHIS 2, health facility communication has improved substantially. By linking nursing stations, laboratories, and consulting rooms, health data is easily accessed and exchanged among stakeholders.[14] This link reduces the duplication of efforts and improves healthcare coordination, improving service delivery. Consistent and complete health data aids repeated analyses and research validity and dependability. DHIS 2 digital records chronicle all medical operations and treatments, increasing accountability and identifying medical negligence.

With its comprehensive illness prevalence and health outcomes data, DHIS 2 allows transnational and comparative investigations. Sharing data will enable researchers from different locations to gain deeper insights and conduct better investigations. The consolidated database improves health-programme monitoring and assessments, which is essential for HIV/AIDS reduction. DHIS 2 provides reliable and timely data for evidence-based policymaking and health goal tracking.

Despite its benefits, implementing DHIS 2 in Kenya is not without its difficulties. Rural health institutions often lack internet and gear. DHIS 2 management and use staff are scarce and require constant training and capacity building. Donor money is unpredictable, putting the system's future in danger. Political and bureaucratic entities that use traditional techniques may resist a centralised health information system, needing strong leadership and advocacy.

Figure 1: Stakeholders in Kenya's District Health Information Software



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Policy Implications, Recommendations, and Conclusion

Kenya's DHIS 2 implementation shows how ICTs can improve health stakeholder collaboration. DHIS 2 has helped physicians provide efficient, targeted treatment by centralising health data and enhancing data access. The long-term viability of systems like DHIS 2 depends on ICT infrastructure, technical competency, and sustainability in financing. Kenya shows the need for measures that address these difficulties while harnessing ICTs' promise to revolutionise public health.

Realising the benefits of ICTs requires continued investment, strong governance, and stakeholder engagement. Governments and development partners should prioritise technical capability and internet connectivity to implement health information systems effectively. To sustain ICT-enabled systems like DHIS 2, policymakers should examine data governance frameworks, security and privacy, and data use and transparency. Indeed, using ICTs can improve governance, outcomes, and sustainable development goals.

Way Forward

Public governance across the world has undergone dramatic changes owing to the integration of technology. This has created opportunities for countries of the Global South, particularly in Africa, to enhance accountability, service delivery, and response time. In Africa, digital transformation in governance has the potential to improve long-standing issues, including corruption, inefficiency, and sub-par service delivery.

The application of big data, ICTs, and e-government platforms has enabled African governments to improve public-service efficiency and foster citizen engagement. Israel Nyadera and Zedekia Sidha, in their articles, explored the role of technology in governance, focusing on big data and ICT-enabled systems in Kenya and beyond.

In the broader African context, technology has the ability to overcome historical governance challenges rooted in colonialism, political instability, and corruption. Small African nations like Benin, Ghana, and Rwanda have made strides in digital governance. However, to move beyond rudimentary e-government solutions, the continent must embrace more advanced technologies such as artificial intelligence (AI), the Internet of Things (IoT), and big data analytics. This report highlights how these technologies can enhance governance by improving policymaking, monitoring government performance, and increasing responsiveness to critical issues like urban migration, famine, and health crises.

There is a need for a holistic approach to digital governance in Africa that prioritises local capacity building, stakeholder collaboration, and sustainable technology solutions. While digital tools such as big data and ICTs have the potential to transform governance and public administration, their successful implementation would require addressing infrastructure gaps, enhancing technical skills, and fostering political will to overcome resistance to change. By focusing on these areas, African countries can leverage technology to create more transparent, efficient, and responsive governance systems that meet the needs of their citizens.

Endnotes

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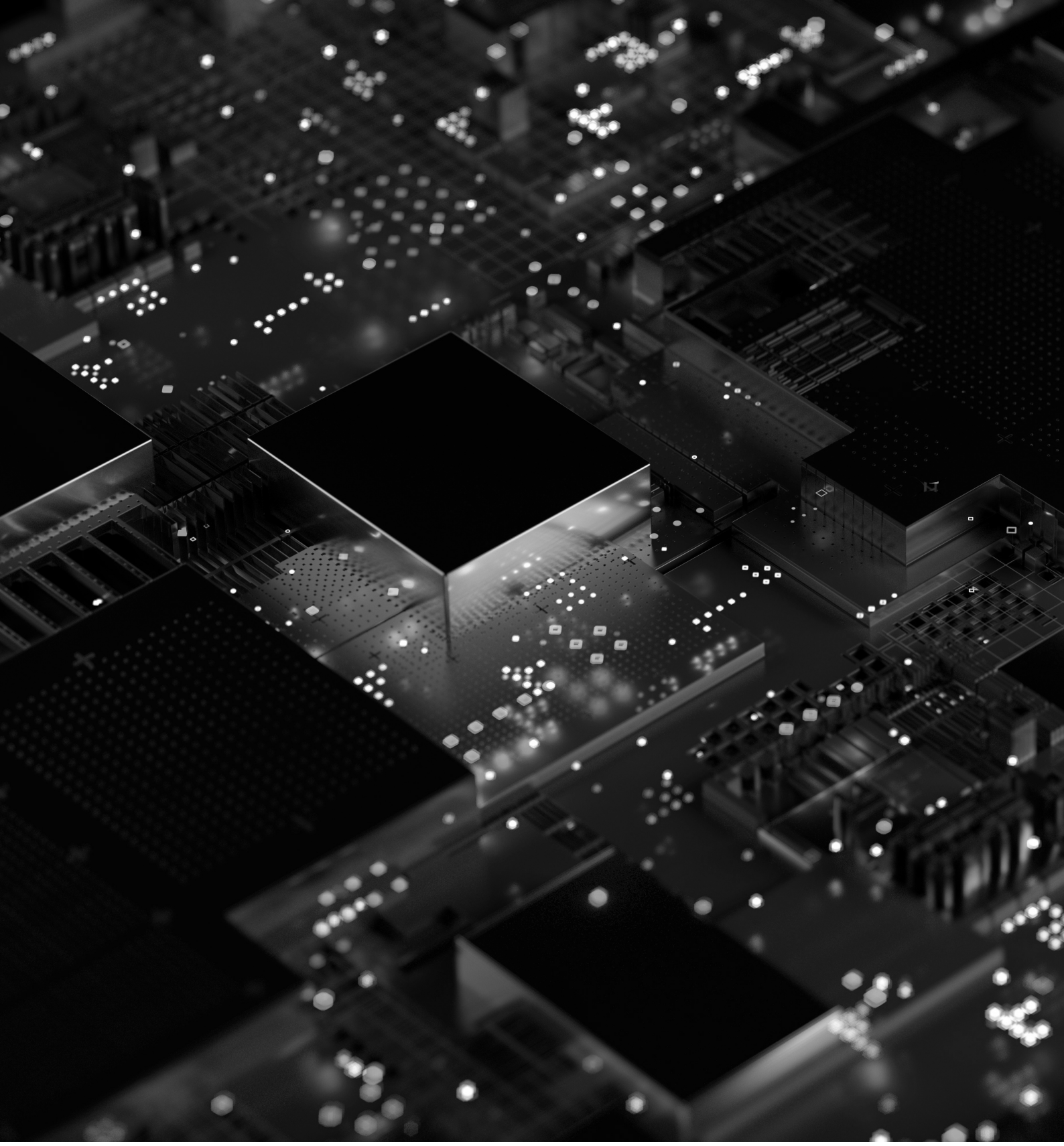

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